C3.ai

Best Practices for Governing the AI Application Lifecycle: The Center of Excellence

A proven model for designing, building and operating a Center of Excellence, to drive AI-enabled digital transformation

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Overview

AI-enabled digital transformation is a complex undertaking, requiring extensive cross-functional collaboration and a range of skill sets. A typical large organization will seek to deploy hundreds of AI-enabled applications in the coming years, and will operate, refine, and support these applications over many years.

Creating an effective organizational structure to govern the development, deployment, and operation of these applications at scale is essential to achieving sustained results. This paper describes the Center of Excellence, a proven model for building this structure.

The contents of this document are adapted from the *C3.ai Application Development Methodology*™ – a comprehensive reference for developing enterprise AI applications on the C3 AI Suite™. This methodology and associated best practices are derived from C3.ai's more than 10 years of experience in working with some of the world's largest organizations – including 3M, Shell, Enel, ENGIE, US Department of Defense, and others – to develop and deploy enterprise-class AI and IoT applications.

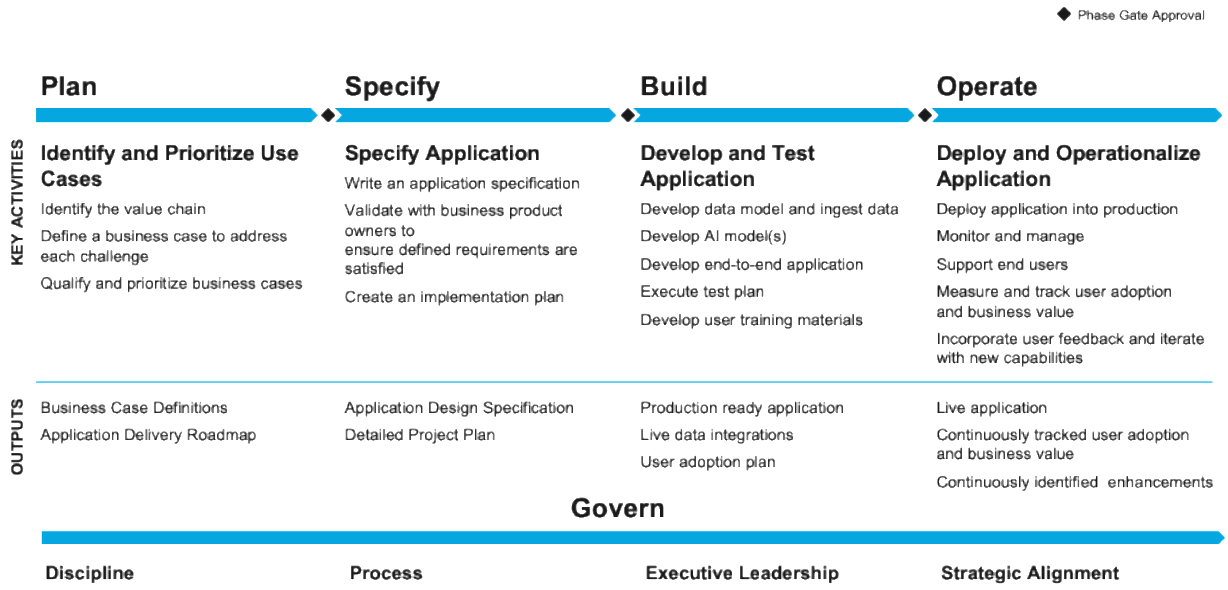


Figure *1*: The creation of a Center of Excellence to manage the AI application lifecycle, from planning through operation, is key to success.

For the purposes of this paper, it is assumed that you are developing your AI applications on the C3 AI Suite™ – C3.ai's comprehensive AI application development platform – although the methodology and best practices are generally applicable.

By following the Center of Excellence (CoE) model, organizations significantly increase their ability to:

- efficiently develop sophisticated AI applications,
- deploy them at enterprise scale, *and*
- realize measurable business value.

Center of Excellence Objectives

The CoE is a generalized model that C3.ai has developed for engaging with our customers, to help them establish and grow their experience in governing the AI application lifecycle.

Below are the key objectives of creating a Center of Excellence.

- Drive consistent, repeatable methods and processes for designing, developing, and deploying enterprise AI applications
- Establish AI technology and development standards
- Provide expert advice and guidance on AI technology and methods
- Resolve technical issues throughout the development process
- Train personnel to become self-sufficient in developing, deploying, and operating AI applications

Benefits of a Center of Excellence

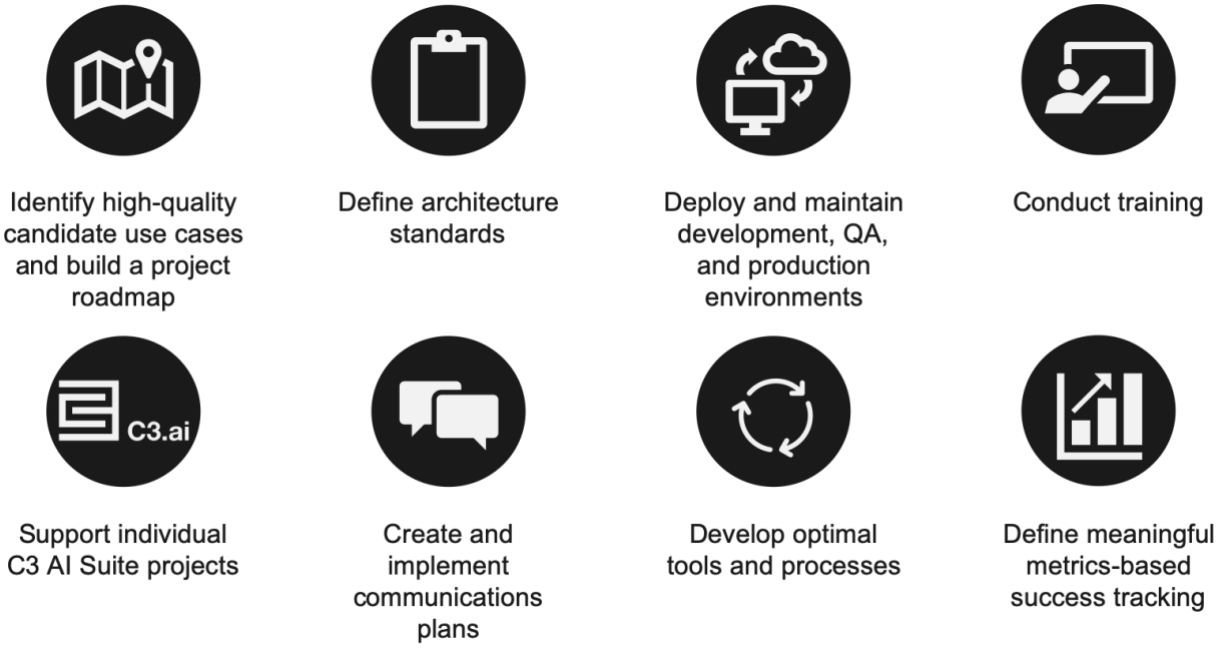
The CoE is an organizational structure that helps ensure a rigorous approach to developing and deploying AI applications at scale, through a set of standardized, repeatable processes.

A CoE brings together expert resources from C3.ai along with resources from the customer organization in a close collaboration designed to pursue specific milestones, goals, and measurable results. Benefits include:

- **Expertise** - Provide access to expert resources able to deliver diverse technical skills required to complete any given AI application project.
- **Scale** - Resolve technical roadblocks that would otherwise impede successful completion of a project as it moves from trial to full deployment.
- **Sustainability** - Support the ongoing operation of the “software development factory,” from identifying needs and opportunities to maintenance and analytics.
- **Reducing Risk** – Help mitigate factors that could impede timely implementation or expected ROI.
- **Maximizing Value** - Helping to drive incremental value in the development process, including planning, specifying, building, and operationalizing.
- **Knowledge Transition** - Transfer skills as efficiently as possible from C3.ai personnel to customer personnel through training, workshops and other means.
- **Self-Sufficiency** - Empower customers to become self-sufficient in driving an ongoing and scalable process of digital transformation, from roadmap to deployment to maintenance and analytics.

Key Activities

The CoE model enables a consistent set of standards and practices to be built and matured over time. It also provides support, guidance, and structure to the business units' projects being built.



Critical Success Factors

The creation of a CoE cuts across multiple functional areas, including business and IT, and requires the following to drive success:

- **Business Sponsorship** – Cascading sponsorship across all levels with aligned objectives
- **Process Discipline** – Clearly defined development process and activities with coaching on best practices for key activities
- **Use Case Prioritization** – Prioritized use cases emerge from analyzing business value, defining selection parameters, and assessing quick wins that demonstrate viability
- **Resourcing** – Trained, dedicated resources including an end-to-end product owner accountable for vision, development, change management, value tracking, and delivery

Center of Excellence Structure

The CoE structure allows governance from a single centralized point and includes the teams identified in Figure 2 below. While every CoE does not necessarily look the same, C3.ai believes that having an organization directly responsible for digital transformation and the C3 AI Suite helps ground the program and provide overall direction.

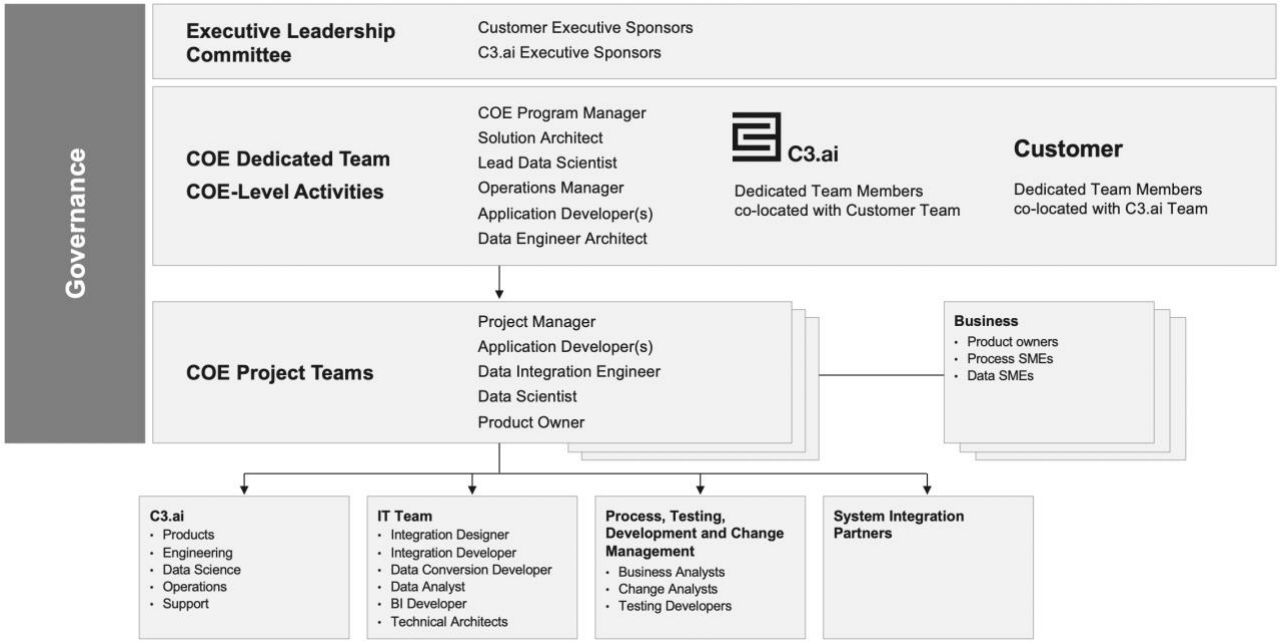


Figure 2: A Center of Excellence combines C3.ai expert resources aligned with customer resources to create effective project governance from a single source.

Center of Excellence Team

The CoE dedicated team is a group of people who serve as the experts in the platform, define and provide direction to the projects, and execute key review points throughout the individual project life cycle. This team is staffed with a combination of full-time equivalent C3.ai resources and customer personnel.

C3.ai CoE resources provide expertise covering aspects of developing and deploying AI-driven enterprise applications, including data science, application development, solution architecture, data integration, and business analysis. Customer resources are aligned with C3.ai resources for on-the-job training and knowledge transition to allow the customer to become self-sufficient over time.

Individual project teams are staffed with a combination of customer and C3.ai team members with a focus on increasing self-sufficiency within the customer organization over time. C3.ai recommends that each project be staffed with a core team consisting of the following roles;

1. Project Manager
2. Solution Architect/Data Integration Engineer
3. Application Developer(s)
4. Data Scientist(s)

During the initial CoE launch, C3.ai recommends that the customer augment the project team with incremental staff over and above the required core roles in order to accelerate availability of team members proficient with the C3 AI Suite for future projects.

C3.ai often leads the initial projects, while training and mentoring customer resources. In subsequent project phases, those customer experts will serve as the leads for the projects with C3.ai providing support and training. This creates a mentorship cycle and helps ensure there are resources proficient with C3 AI Suite on every project at any point in time.

In addition to the project specific roles, there are a number of leveraged roles that will contribute and participate in the overall program including:

Role	Description
Executive Sponsor	Provides oversight and strategic direction, and addresses potential risks
Product Owner	Owns the target AI application, accountable for vision, development, change management, value tracking, and delivery
Program Manager	Leads implementation activities; manages program and project plans; communicates and tracks risks; communicates with Executive Committee to report status, escalate and manage risks
Operations Manager	Maintains development, QA, and production environments; advises on optimum cluster and environment configuration
Solution Architect	Leads the technical team; develops technical design specifications; and oversees the technical development
Data Engineer Architect	Standardizes on data extraction, transformation into C3 Canonical, and integration to the C3 AI Suite
Lead Data Scientist	Leads data scientists to develop and deploy production AI models using C3 AI Suite and built-in tools
Lead Application Developer	Configures application and reviews configuration specifications; reviews developer code; and assists with development activities on C3 AI Suite

The size of the CoE team will vary based on the digital transformation maturity in the company. Typically, large program deliveries are staffed with 12 or more dedicated resources and smaller programs between 3-5 dedicated resources.

Large organizations that are embarking on AI projects across multiple business units, functional areas, and geographies can also consider creating multiple Centers of Excellence, coordinated through a central steering committee to maintain alignment across the centers. Some organizations establish CoEs by business unit or use case; others maintain a centralized CoE with satellite hubs. Your approach can evolve over time, starting with a single CoE and then adapting as your project requirements change and grow.

Staffing the Team

Picking the right team is the most important factor in driving the overall success of the CoE.

Top talent is important to ensure thought leaders driving a step change to successfully embed AI-based applications into the business. Identify the top 5% in the company – **only the best architects, developers, and data scientists.**

Identifying the right talent, training those resources on the C3 AI Suite capabilities, assembling well-rounded project teams, and providing avenues of continuous learning and personal development are imperatives in deploying high-performing teams to build applications on the C3 AI Suite.

Resources that are best in driving success are:

- Passionate
- Excited to learn
- Collaborative
- Motivated to be on the cutting edge

With a culture and vision established for the program team, the next step is to identify the talent that will best get the job done. The skillset that C3.ai recommends focusing on includes, but is not limited to, the following:

- Demonstrated proficiency in full-stack software development
- Demonstrated proficiency in JavaScript and/or Python
- Sound understanding of database types and trade-offs
- Sound understanding of cloud computing concepts
- Strong analytical ability and problem-solving skills
- Bachelor's degree in a Science, Technology, Engineering, or Math field

Immediately following the training C3.ai offers, the developers will be deployed on a project. C3.ai cannot stress enough the importance of "just in time" training. As the project teams are assembled, consider the strengths and weaknesses of each individual to build a team of complementary strengths (front-end / back-end; data integration / distributed computing; etc.). Even the most experienced software engineers will require a ramp-up period while they gain comfort and familiarity with the C3 AI Suite features and functionality. Therefore, assembling a mix of experienced and inexperienced C3 AI Suite developers will enable increased knowledge transfer and natural on-boarding for the new team members.

Conclusion

The Center of Excellence methodology summarized in this document provides a proven framework for successfully governing an enterprise AI program at scale. This Center of Excellence model is an element of the ***C3.ai Application Development Methodology***™ – a comprehensive reference for developing enterprise AI applications on the C3 AI Suite™. The C3.ai Application Development Methodology articulates each phase of the entire end-to-end development process, providing a detailed set of activities and templates in order to complete the necessary steps to go from an idea to a production application.

To learn more about the C3.ai Application Development Methodology, contact C3.ai at C3.ai/get-started.

About C3.ai

C3.ai is a leading AI software provider for accelerating digital transformation. C3.ai delivers the C3 AI Suite™ for developing, deploying, and operating large-scale AI, predictive analytics, and IoT applications in addition to an increasingly broad portfolio of turn-key AI applications. The core of the C3.ai offering is a revolutionary, model-driven AI architecture that dramatically enhances data science and application development.

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